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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,150	08/31/2000	Kazuhiro Hoshino	SON-1894	2607

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Ronald P. Kananen, Esq.
RADER, FISHMAN & GRAUER
The Lion Building
1233 20th Street, N.W., Suite 501
Washington, DC 20036

EXAMINER

HERNANDEZ, NELSON D

ART UNIT	PAPER NUMBER
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2622

MAIL DATE	DELIVERY MODE
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12/13/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/652,150	Applicant(s) HOSHINO ET AL.	
	Examiner Nelson D. Hernández	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The Examiner acknowledges the amended claims filed on September 13, 2007.

Claims 1-29 have been canceled. **Claims 30-45** have been newly added.

Response to Arguments

2. Applicant's arguments with respect to **claims 30-45** have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 30-38, 40, 41, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura et al., US Patent 5,130,804 and Stern et al., US Patent 6,147,389 in view of Kawabe et al., JP 7-212633 and further in view of Takachi, JP 10-321827 A.**

Regarding claim 30, Tamura et al. discloses an optical system having an optical module (See fig. 5), the optical module comprising: an optical element (CCD 17 as shown in fig. 5) including a light receiving portion; a lens barrel (Fig. 5: 37) having a lens

(group of lenses 39 as shown in fig. 5) and an opening to expose said lens and light receiving portion of the optical element (See fig. 5); a plate (The examiner is reading the protrusion 48 shown in fig. 6 as the plate; said protrusion 48 is used to accurately position the CCD 17); and a wiring board (Fig. 5: B), said wiring board being between said optical element and said lens barrel (See fig. 5), wherein said plate is of a first material (the plate being of a first material is inherently disclosed in Tamura et al. since it is expected to have the plate of a particular material), wherein said light receiving portion and said lens are disposed along an optical axis (See fig. 5), wherein a through-hole (See fig. 5) extends through said lens barrel, said plate, and said wiring board (See through-hole extending through the lens barrel, the wiring board and said plate as shown in fig. 5. In fig. 6, the plate is shown having a hole to expose the light receiving portion), wherein said optical axis extends through said opening, said optical filter, and said through-hole (See fig. 5) (Col. 4, line 43 – col. 5, line 54).

Although Tamura et al. discloses the plate being between the optical element and the substrate and the substrate between the plate and the lens unit, Tamura et al. does not explicitly disclose the wiring board being of a material different from the material of the plate, the wiring board being between the optical element and the plate, the plate being between the wiring board and the lens barrel; the light receiving portion being between a shielding layer and a lens; and the lens barrel having a diaphragm portion, an optical filter between said lens and said diaphragm portion of a lens barrel and said barrel having an opening through said diaphragm portion exposing said optical filter.

However, Stern et al. teaches an optical system having an optical module (See fig. 7A), the optical module comprising: a substrate (See fig. 7A), the substrate including a plate (Fig. 7A: 701) of a first material (the plate being of a first material is inherently disclosed in Stern et al. since it is expected to have the plate of a particular material) adhered to a wiring board (frame 310 as shown in fig. 7A, which is also electrically connected to a substrate 710, frame 310 acts as a wiring board by supplying electrical connection between the optical element 306 and the substrate 710), a through-hole extending through the plate and the wiring board (See fig. 7A); an optical element (Fig. 7A: 306) mounted to the wiring board, the optical element including a light receiving portion, the wiring board (310) being between the optical element (306) and the plate (701) (See fig. 7A); and a lens unit (Stern et al. teaches a window 302 mounted to the plate but also teaches that a lens can be mounted to the plate; col. 4, lines 36-55) mounted to the plate, the plate being between the wiring board and the lens unit (See fig. 7A), wherein the light receiving portion and the lens are disposed along an optical axis, the optical axis extending through the through-hole (See fig. 7A); Stern et al. also discloses a shield layer (Fig. 7A: 308, the Examiner is reading the plate 308 as the shielding layer since the plate is a metal plate that is used to cover the optical module from the back portion), wherein the light receiving is between the shielding layer and the lens (See fig. 7A) (Col. 3, line 60 – col. 4, line 67; col. 6, lines 5-28).

Although Stern et al teaches a lens 302 mounted to the plate instead of a lens barrel, after considering the teaching of Tamura et al. in view of Stern et al. as a whole and that the lens barrel having at least one lens (see Tamura et al., fig., 5) can be used

to direct the light to the light receiving portion, one of an ordinary skill in the art would find obvious at the time the invention was made to modify Tamura et al. by having the wiring board being between the optical element and the plate, to have the said lens barrel mounted to the plate and the plate being between the wiring board and the lens barrel and to have a shielding layer such that the light receiving is between the shielding layer and the lens. The motivation to do so would have been to provide the optical module with a reference plane, said reference plane of the optical module being aligned with respect to an image plane of the sensor such that the sensor can be mounted in an optical assembly quickly, easily, accurately, and inexpensively and to cover the back as suggested by Stern et al. (Col. 1, lines 35-64).

The combined teaching of Tamura et al. in view of Stern et al. fails to teach that the wiring board being of a material different from the material of the plate; the lens barrel having a diaphragm portion, an optical filter between said lens and said diaphragm portion of a lens barrel and said barrel having an opening through said diaphragm portion exposing said optical filter.

However, Kawabe et al. teaches an optical system having an optical module (See fig. 1), the optical module comprising: a substrate the substrate including a plate (Fig. 1: 3) of a first material (metal) adhered to a wiring board (Fig. 1: 2), of a material other than the first material, an optical element (CCD 1 as shown in fig. 1) mounted to the wiring board (through the metal plate), the optical element including a light receiving portion; and a lens unit (Fig. 1: 4) mounted to the plate, the lens unit including a lens (Fig. 1: 5), the plate being between the wiring board and the lens unit, wherein the light

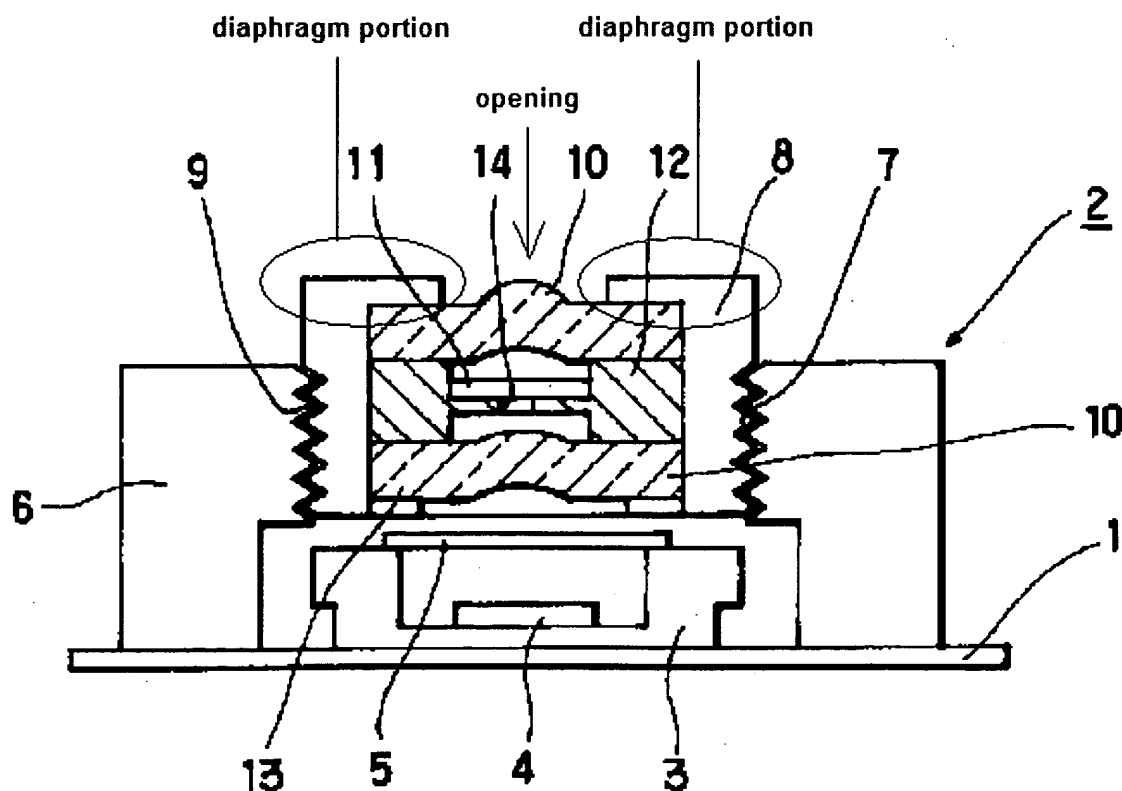
receiving portion and the lens are disposed along an optical axis, the optical axis extending through a through-hole (See fig. 1) (See Machine Translation page 3, ¶ 0007-0011; see also page 2, ¶ 0003-0006).

Therefore, taking the combined teaching of Tamura et al. in view of Stern et al. and further in view of Kawabe et al. as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the material of the plate in Tamura et al. and Stern et al. to have a material (metal) different from the material of the wiring board. The motivation to do so would have been to protect the substrate from any fissure or crack from occurrence to the optical system due to heat generated by the optical unit as suggested by Kawabe et al. (Machine Translation, page 2, ¶ 0006 and page 3, ¶ 0007; see also page 2, ¶ 0003).

The combined teaching of Tamura et al. in view of Stern et al. and further in view of Kawabe et al. fails to teach the lens barrel having a diaphragm portion, an optical filter between said lens and said diaphragm portion of a lens barrel and said barrel having an opening through said diaphragm portion exposing said optical filter.

However, Takachi teaches an optical system having an optical module (Fig. 3), the optical module comprising: an optical element (Fig. 3: 4) including a light receiving portion, a lens (Fig. 3: 13); an infrared filter (Fig. 3: 11) between said lens and a diaphragm portion (See diaphragm portion as shown in fig. 3 illustrated bellow) of a lens barrel (Fig. 3: 8, although the specification in Takachi identifying 6 as the lens barrel, the Examiner is reading 8 as the lens barrel holding the lens and the optical infrared filter), an opening through said diaphragm portion exposing said optical filter (See opening

Fig. 3



Therefore, taking the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi as a whole, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to modify the teaching of Tamura et al., Stern et al. and Kawabe et al. by having the lens barrel having a diaphragm portion, an optical filter between said lens and said diaphragm

portion of a lens barrel and said barrel having an opening through said diaphragm portion exposing said optical filter. The motivation to do so would have been to secure the optical elements inside the lens barrel as taught by Takachi (Machine English Translation (Page 2, ¶ 0004) and to correct the spectral sensitivity of the light receiving region by using the optical filter.

Regarding claim 31, the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi as discussed and analyzed in claim 30 teaches that the optical filter and said lens are moveable in a direction along said optical axis (as shown in Takachi, fig. 3, the optical elements including the lens 13 and the optical filter 11 are moveable in the direction along said optical axis by using screw threads 9 and 7 of the lens barrel). Grounds for rejecting claim 30 apply here.

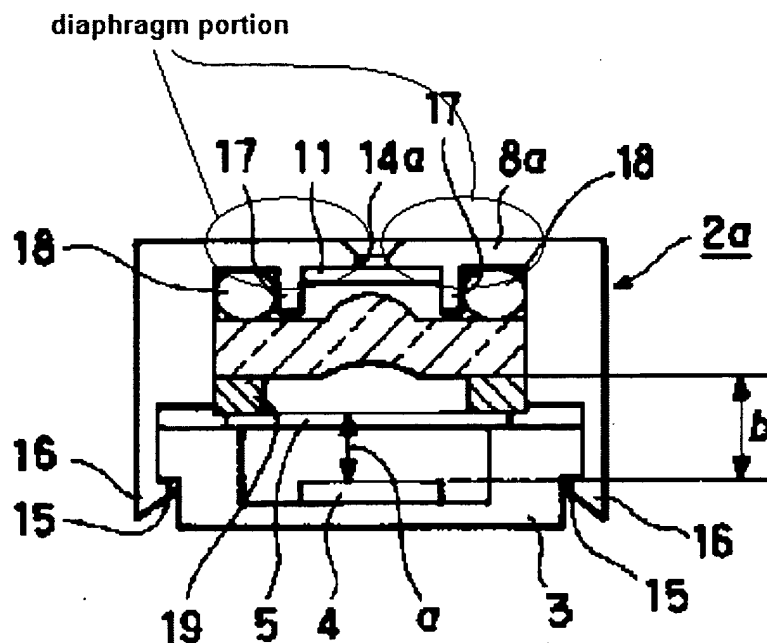
Regarding claim 32, limitations have been discussed and analyzed in claim 30.

Regarding claim 33, the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi as discussed and analyzed in claim 30 teaches that the lens barrel is in an inner periphery of a holder (See Takachi, fig. 3: 6), said plate being between said holder and said wiring board (this is taught with the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi, wherein the Takachi reference teaches the holder 6 holding the barrel 8, that as discussed in claim 30 would have the plate being between said holder and said wiring board since the barrel is attached to the barrel by screw threads 7 and 9). Grounds for rejecting claim 30 apply here.

Regarding claim 34, limitations have been discussed and analyzed in claim 33.

Regarding claim 35, the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi as discussed and analyzed in claim 30 teaches that the diaphragm portion contacts said optical filter (As shown in fig. 1 in an embodiment of Takachi teaches the optical infrared filter 11 in contact to a diaphragm portion of the barrel as shown in fig. 1 illustrated below). Grounds for rejecting claim 30 apply here.

Fig. 1



Regarding claim 36, limitations have been discussed and analyzed in claim 30.

Regarding claim 37, limitations have been discussed and analyzed in claim 30.

Regarding claim 38, limitations have been discussed and analyzed in claim 30.

Regarding claim 40, limitations have been discussed and analyzed in claim 30.

Regarding claim 41, limitations have been discussed and analyzed in claim 30.

Regarding claim 44, the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi as discussed and analyzed in claim 30 teaches the optical system applied to an imaging device (See Tamura et al., video camera 1 as shown in fig. 1; see also Stern et al., col. 3, lines 37-45; Kawabe et al., Machine Translation, page 2, ¶ 0001). Grounds for rejecting claim 30 apply here.

Regarding claim 45, limitations have been discussed and analyzed in claims 30 and 44. Grounds for rejecting claim 30 apply here.

5. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura et al., US Patent 5,130,804, Stern et al., US Patent 6,147,389 and Kawabe et al., JP 7-212633 in view of Takachi, JP 10-321827 A and further in view of Furukawa et al., US Patent 6,262,513 B1.

Regarding claim 39, the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi fails to teach bumps electrically connect said wiring board with said optical element.

However, Furukawa et al. discloses an optical system having an optical module (Fig. 39), the optical module comprising an optical element having a light receiving portion (CCD 117 as shown in fig. 39) connected to a wiring board (Fig. 39: 116) having a trough-hole for allowing the light to reach the light receiving portion of the optical element, wherein the optical element is electrically connected to the wiring board by using bumps (Fig. 39: 112) (Col. 148, line 50 – col. 149, line 5).

Therefore, taking the combined teaching of Tamura et al., Stern et al. and Kawabe et al. in view of Takachi and further in view of Furukawa et al. as a whole, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to modify the teaching of Tamura et al., Stern et al., Kawabe et al. and Takachi by using bumps as an alternative to electrically connecting the optical element to the wiring board. The motivation to do so would have been to have an alternative way to electrically connect the imaging element to the wiring board while securing a space portion between the image element and the wiring board.

6. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura et al., US Patent 5,130,804, Stern et al., US Patent 6,147,389 and Kawabe et al., JP 7-212633 in view of Takachi, JP 10-321827 A and further in view of Uchino et al., US Patent 6,392,703 B1.

Regarding claim 42, the combined teaching of Tamura et al. and Stern et al. in view of Kawabe et al. and further in view of Takachi fails to teach that the shielding layer is a resin layer.

However, Uchino et al. discloses an optical system (Fig. 7), comprising an optical module (Fig. 7: 2) having a shielding member (Fig. 7: 903; resin member in contact to the optical module and to the wiring board (Fig. 7: 1) used to protect the optical module and to increase its strength with respect to the wiring board; col. 9, lines 36-56).

Therefore, taking the combined teaching of Tamura et al., Stern et al. and Kawabe et al. in view of Takachi and further in view of Uchino et al. as a whole, it would

have been obvious to one of ordinary skill in the art at the time the invention was made to modify the optical system by having a shielding layer made with resin. The motivation to do so would have been to improve the optical system efficiency by protecting the optical module and to increase its strength with respect to the wiring board as suggested by Uchino et al. (col. 9, lines 36-56).

Regarding claim 43, limitations have been discussed and analyzed in claim 42.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernández whose telephone number is (571) 272-7311. The examiner can normally be reached on 9:30 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nelson D. Hernández
Examiner
Art Unit 2622

NDHH
December 5, 2007


TUAN HO
PRIMARY EXAMINER